



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,163	12/27/2001	Joong Jeon	G0518	1562

7590

11/06/2002

Joseph J. Crimaldi
Renner, Otto, Boisselle & Sklar, LLP
Nineteenth Floor
1621 Euclid Avenue
Cleveland, OH 44115

EXAMINER

FOONG, SUK SAN

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,163

Applicant(s)

JEON, JOONG

Examiner

Suk-San Foong

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 7 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to because in Fig. 10, it appears that the term "OPIONAL" is misspelled. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Specification

3. The abstract of the disclosure is objected to because it contains two paragraphs. Correction is required. See MPEP § 608.01(b).
4. The disclosure is objected to because of the following informalities: the statement on instant page 8, lines 18-19 is not understood.

Appropriate correction is required.

Art Unit: 2823

5. The disclosure is objected to because of the following informalities: on instant page 13, lines 5 and 11, "silicon" is objected to not being normally considered a gate dielectric material suitable as a gate dielectric. In this regard, note that instant Table 1 does not include "silicon".

Appropriate correction is required.

Claim Objections

6. Claims 7 and 16 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 requires annealing to form a composite dielectric layer. Claims 7 and 16 merely label the product resulting from claims 1 and 10, respectively. Furthermore, see instant page 14, lines 1-4 and page 11, lines 11-16.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the process of claim 1 and further including that the standard-k dielectric material is one of the materials recited in claim 2 and the high-k dielectric is one of those recited in claim 6, does not reasonably provide enablement for recitation of "high-k

Art Unit: 2823

dielectric material” and “standard-k dielectric material” broadly. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Chemical reactivity is a most unpredictable and empirical art and it is well settled that the requirement that the claims be commensurate in scope with the enabling disclosure is particularly stringent in this area of technology. In re Doumani 126 USPQ 408, In re Grant 134 USPQ 248, In re Fisher 166 USPQ 18, Mobil Oil Corporation v. W. R. Grace and Company 180 USPQ 418, In re Slocombe 184 USPQ 740, In re Mercier 185 USPQ 774, Corona Cord Tire Company v. Dovan Chemical Corporation 192 CD 255, See In re Hawkins 174 USPQ 157 (pg. 163) reasoning is sufficient, evidence is not required.

Allowable Subject Matter

9. Claims limited to the process of claim 1 and further including that the standard-k dielectric material is one of the materials recited in claim 2 and the high-k dielectric is one of those recited in claim 6 would be allowable.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ma et al. ('340) discloses a method of alternating high-k dielectric materials and standard-k dielectric materials to form a multiplayer dielectric stack and then performing an anneal process to condition the interface between the layers. Ballantine et al. ('592), Cartier et


Art Unit: 2823


al. ('556), Bojarczuk, Jr. et al. ('168) and Parsons et al. ('666) disclose a chemical reaction between silicon dioxide layer, for example, and metal oxides during an annealing process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suk-San Foong whose telephone number is 703-305-0383. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431, 3432).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


November 3, 2002


George Fourson
Primary Examiner
Art Unit 2823